WHAT IS CLAIMED IS:

1. A train collision avoidance system comprising:

a data base storing train grade crossing data, and for each train grade crossing data, storing in association therewith heading data of a road;

a processor programmed to receive GPS vehicle location data that periodically identifies a location of a vehicle, and programmed to use said GPS vehicle location data and said train grade crossing data to determine if the vehicle is within a predefined distance from a grade crossing;

said processor being programmed to correlate the heading data of a road with a heading of the road vehicle; and

said processor is programmed to provide a sensory indication when the vehicle is within the predefined distance from the grade crossing and when the road vehicle is on a road that intersects with the grade crossing.

2. The train collision avoidance system of Claim 1, wherein said data base stores in association with train grade crossing data, direction data that identifies a direction of a road that intersects a railroad track at the grade crossing.

3. The train collision avoidance system of Claim 2, wherein said processor is programmed to receive vehicle direction of travel data and compare said vehicle direction of travel data with the direction data stored in said data base, and if said vehicle is within the predefined distance from said grade crossing and if said vehicle direction of travel coincides with the direction data, said sensory indication is provided.

4. The train collision avoidance system of Claim 2, wherein for each train grade crossing data stored in said data base, there is stored in association therewith direction data of at least one road that intersects a railroad track at a grade crossing identified by the train grade crossing data.

5. The train collision avoidance system of Claim 4, wherein said train grade crossing data and said direction data are written into said data base so as to be read out together during one read operation of the data base.

7.   The train collision avoidance system of Claim 1, wherein said processor is programmed to process said GPS vehicle location data so as to provide a radius of protection around the vehicle, said radius defined by said predefined distance.

8.   The train collision avoidance system of Claim 6, wherein said GPS vehicle location data comprises latitude and longitude coordinates, and is processed by changing a respective least significant bit thereof to reduce an accuracy of the location of the vehicle.

9.   The train collision avoidance system of Claim 8, wherein said processor is programmed to change a least significant bit of said longitude and a least significant bit of said latitude coordinates by adding and subtracting a predefined number.

6.   The train collision avoidance system of Claim 2, wherein said direction data comprises a range of compass degrees.

10.   The train collision avoidance system of Claim 1, wherein said processor is programmed to receive vehicle speed data and to change said predefined distance as a function of the vehicle speed data.

11.   A train collision avoidance system, comprising:

a first detector for detecting a geographical location of a vehicle;

a second detector for detecting a proximity of a train near the vehicle;

a direction sensing device for providing data indicating a heading of the vehicle;

a data base storing geographical coordinates of grade crossings where a road intersects a railroad track;

a processor that is programmed to compare the geographical location of the vehicle with the coordinates of the grade crossing to determine whether the vehicle is within a prescribed distance from the grade crossing; and

said processor is programmed to provide a sensory indication when said comparison is affirmative, when said detector detects a proximity of the train near the vehicle, and when the heading of the vehicle will cause the vehicle to intersect the grade crossing.

12.   The train collision avoidance system of Claim 11, wherein said detector uses GPS signals to provide latitude and longitude parameters of geographical locations of the vehicle.

13.   The train collision avoidance system of Claim 11, wherein said second detector uses a transmitted signal from a train to detect a proximity thereof to the vehicle.

14.   The train collision avoidance system of Claim 11, wherein said processor is programmed to vary said prescribed distance as a function of a speed of the vehicle.

15.   The train collision avoidance system of Claim 11, wherein said sensory indication comprises a warning, and said processor is programmed to provide an alert sensory indication when said vehicle is detected as being within said prescribed distance from said grade crossing and a proximity of a train has not been detected.

16.   The train collision avoidance system of Claim 11, wherein said sensory indication comprises a visual indication, and further including an audible indication that is provided only for a predefined period of time, and then is extinguished.

17.   The train collision avoidance system of Claim 11, wherein said processor is programmed to process a geographical coordinate stored in said data base by modifying the geographical coordinate by changing a least significant digit thereof.

18.   The train collision avoidance system of Claim 17, wherein said geographical coordinate system comprises a multi-digit latitude parameter and a multi-digit longitude parameter, and said processor is programmed to dither the latitude and longitude parameters to provide said prescribed distance from said grade crossing.

19.   The train collision avoidance system of Claim 18, wherein said latitude and longitude parameters are dithered to different extents, as a function of a speed of the vehicle.

20.   The train collision avoidance system of Claim 19, wherein each said parameter is dithered by the same amount for a given speed of the vehicle.

21.   The train collision avoidance system of Claim 11, wherein said data base is configured to store data corresponding to geographical locations of a plurality of grade crossings that intersect respective roads, and stores in association with each said geographical location other data representing a compass direction of at least one road that intersects the railroad tracks at said grade crossing.

23 22. A method of avoiding a collision with a train, comprising the steps of:

providing an indication of a location of a vehicle;

providing an indication of a direction of travel of the vehicle;

reading from a data base, data identifying a location of one or more train grade

5   crossings, and data identifying a heading of at least one road intersecting the train

grade crossing;

comparing the indication of the vehicle location with the location of the train

grade crossing;

comparing the indication of the direction of travel of the vehicle with the

10   heading of at least one road intersecting the train grade crossing; and

if the vehicle location is within a specified distance from the train grade

crossing, and if the direction of travel of the vehicle corresponds to the heading of the

road, providing a sensory indication of a potential for a collision between the train and

the vehicle.

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